



TFT LCD Evaluation Specification

MODEL NO.: V216B1- LN1

LCD TV Head Division	
AVP	

QRA Dept.	TVHD / PDD		
	DDIII	DDII	DDI
Approval	Approval	Approval	Approval

LCD TV Marketing and Product Management Division	
Product Manager	

1. GENERAL SPECIFICATIONS

1.1 OVERVIEW

The V216B1-LN1 model is a 21.6 inch wide TFT-LCD module with a 4-CCFL Backlight Unit and a 55-pin 1-path RSDS interface. This module supports 1366 x 768 (16:9 wide screen) mode and displays up to 16.7 millions colors. The inverter module for the Backlight Unit is not built in.

1.2 GENERAL

Item	Specification	Unit	Note
Active Area	477.417 (H) x 268.416 (V) (21.6" diagonal)	mm	
Bezel Opening Area	481.5 (H) x 272.5 (V)	mm	
Driver Element	a-si TFT active matrix	-	
Pixel Number	1366 x R.G.B. x 768	pixel	
Pixel Pitch (Sub Pixel)	0.1165 (H) x 0.3495 (V)	mm	
Pixel Arrangement	RGB vertical stripe	-	
Display Colors	16.7 millions	color	
Display Operation Mode	Transmissive mode / Normally White	-	
Surface Treatment	Hard coating (3H), AG (Haze 25%)	-	

1.3 MECHANICAL

Item	Min.	Typ.	Max.	Unit	Note
Module Size	Horizontal(H)	500.3	501	501.7	mm
	Vertical(V)	296.4	297	297.6	mm
	Depth(D)	16.8	17.3	17.8	mm
	Depth(D)	Na	Na	Na	mm
Weight	Na	TBD	Na	g	

2. ABSOLUTE MAXIMUM RATINGS

2.1 TFT LCD MODULE

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Power Supply Voltage	VAA	-0.3	14.0	V	
	VGH	-0.3	30.0	V	
	VGL	-10.0	-0.3	V	
Input Signal Voltage	VIN	-0.3	3.6	V	

2.2 BACKLIGHT UNIT

Item	Symbol	Test Condition	Min.	Type	Max.	Unit	Note
Lamp Voltage	V _w	Ta = 25 °C	—	—	3000	V _{RMS}	

3. ELECTRICAL CHARACTERISTICS

3.1 TFT LCD MODULE

Ta = 25 ± 2 °C

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Power Supply Voltage	V _{GH}	22	23	24	V	
	V _{GL}	-6.0	-5.5	-5.0	V	
	V _{AA}	13.25	13.5	13.75	V	
	V _{33V}	3.2	3.3	3.4	V	
Power Supply Current	I _{GH}	-	10	-	mA	
	I _{GL}	-	3	-	mA	
	I _{AA}	-	190	250	mA	
	I _{33V}	-	110	-	mA	

Note (1) I_{AA} value is maximum at black pattern

3.2 CCFL (Cold Cathode Fluorescent Lamp) CHARACTERISTICS (Ta = 25 ± 2 °C)

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Lamp Voltage	V _w	-	800	-	V _{RMS}	I _L = 7.0mA
Lamp Current	I _L	6.5	7.0	7.5	mA _{RMS}	

Note (1) The waveform of the voltage output of inverter must be area-symmetric and the design of the inverter must have specifications for the modularized lamp. The performance of the Backlight, such as lifetime or brightness, is greatly influenced by the characteristics of the DC-AC inverter for the lamp. All the parameters of an inverter should be carefully designed to avoid producing too much current leakage from high voltage output of the inverter. When designing or ordering the inverter please make sure that a poor lighting caused by the mismatch of the Backlight and the inverter (miss-lighting, flicker, etc.) never occurs. If the above situation is confirmed, the module should be operated in the same manners when it is installed in your instrument.



4. INTERFACE PIN CONNECTION

4.1 TFT LCD MODULE

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	GND	Ground	29	GM8	Gamma voltage 8
2	B2P	RSDS data signal (Blue 2)	30	GM7	Gamma voltage 7
3	B2N	RSDS data signal (Blue 2)	31	GM6	Gamma voltage 6
4	B1P	RSDS data signal (Blue 1)	32	GM5	Gamma voltage 5
5	B1N	RSDS data signal (Blue 1)	33	GM4	Gamma voltage 4
6	B0P	RSDS data signal (Blue 0)	34	GM3	Gamma voltage 3
7	B0N	RSDS data signal (Blue 0)	35	GM2	Gamma voltage 2
8	G2P	RSDS data signal (Green 2)	36	GM1	Gamma voltage 1 (highest)
9	G2N	RSDS data signal (Green 2)	37	GND	Ground
10	G1P	RSDS data signal (Green 1)	38	VDD	Driver IC logic power supply
11	G1N	RSDS data signal (Green 1)	39	VDD	Driver IC logic power supply
12	G0P	RSDS data signal (Green 0)	40	VAA	Source IC analog power supply
13	G0N	RSDS data signal (Green 0)	41	VAA	Source IC analog power supply
14	CLKP	RSDS clock	42	VAA	Source IC analog power supply
15	CLKN	RSDS clock	43	TP1	Source IC data latch
16	R2P	RSDS data signal (Red 2)	44	POL	Source IC output polarity
17	R2N	RSDS data signal (Red 2)	45	STH	Horizontal start pulse
18	R1P	RSDS data signal (Red 1)	46	NC	No connection
19	R1N	RSDS data signal (Red 1)	47	NC	No connection
20	R0P	RSDS data signal (Red 0)	48	STV	Vertical start pulse
21	R0N	RSDS data signal (Red 0)	49	CKV	Gate IC clock
22	GND	Ground	50	OE	Gate IC output enable
23	GM14	Gamma voltage 14 (lowest)	51	/XAO	Force Gate IC output to Vgh level
24	GM13	Gamma voltage 13	52	VGL	Gate IC power supply
25	GM12	Gamma voltage 12	53	GND	Ground
26	GM11	Gamma voltage 11	54	VGH	Gate IC power supply
27	GM10	Gamma voltage 10	55	GND	Ground
28	GM9	Gamma voltage 9			

Note (1) Connector part no.: STARCONN 089H55-000000-G2-C (0.5mm FFC) or compatible

5. OPTICAL CHARACTERISTICS

5.1 OPTICAL CHARACTERISTICS

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR	$\theta_x=0^\circ, \theta_y=0^\circ$ Viewing Normal Angle	600	800		-	
Response Time		T _R			1.3	2.2	ms	
		T _F			3.7	5.8		
Center Luminance of White		LC		300	400		cd/m ²	
Viewing Angle	Horizontal	θ_{x+}	CR $\geq$ 10	75	85		Deg.	
		θ_{x-}		75	85			
	Vertical	θ_{y+}		70	80			
		θ_{y-}		70	80			

5.2 TEST CONDITIONS

Item	Symbol	Value	Unit
Ambient Temperature	T _a	25 $\pm$ 2	°C
Ambient Humidity	H _a	50 $\pm$ 10	%RH
Supply Voltage	V _{CC}	5.0	V
Input Signal	According to typical value in "3. ELECTRICAL CHARACTERISTICS"		
Inverter Current	I _L	7.0	mA
Inverter Driving Frequency	F _L	50	KHz
Inverter	Ampower (27-D024817)		